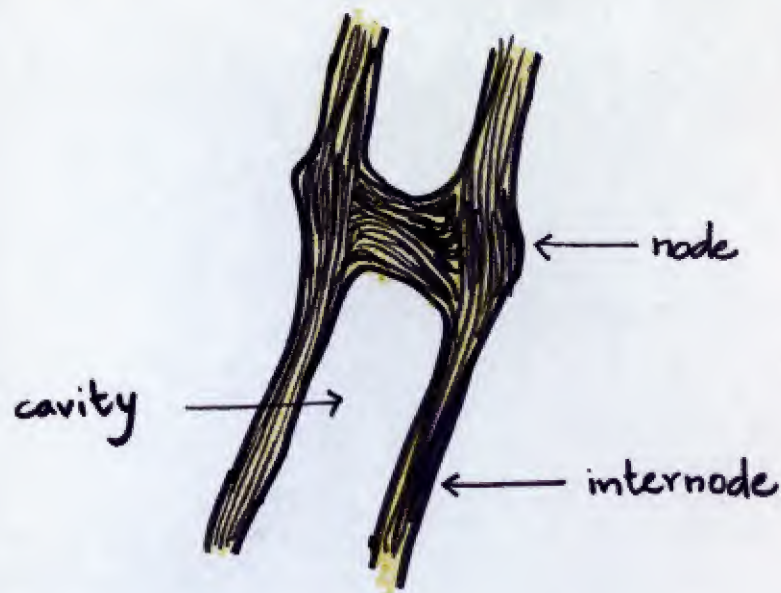
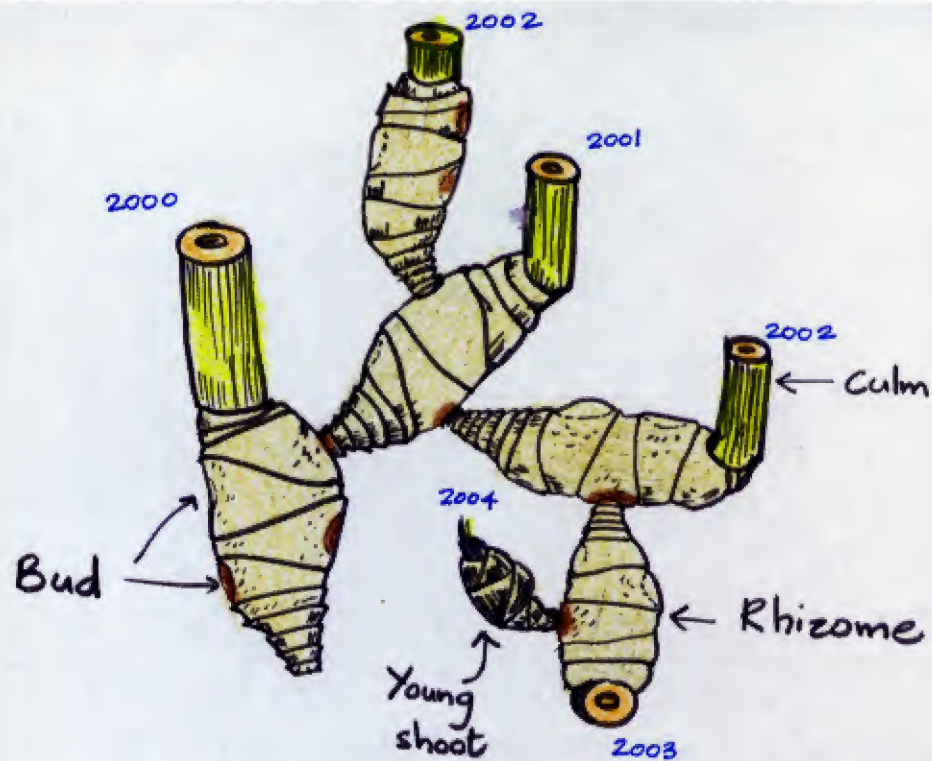




Bamboo is a giant grass



- Its stock consists of nodes and internodes
- Its body is made up of long fibres running from bottom to top.



- The underground part of the shoot is called 'Rhizome' - looks like a giant ginger.
- Every year, each plant of bamboo puts out new rhizomes which grow into bamboo poles.



- Forest bamboo grows wild. No human being tends or looks after it.
- The bamboo poles are usually deformed and misshapen.
- There is sometimes severe pest attack



- Cultivated bamboo is near human habitation or on farm.
- They are kept clean and before the rain people pack mud all around the bamboos.
- People watch out for any disease or pest attack

Managing Cultivated Bamboo

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To get a good yield of supreme bamboo, village people often do the following:



- Keep the area around the bamboo clean and free of waterlogging.



- Pack earth at the base of each bamboo plant.



- Add organic manure to each plant once a year.



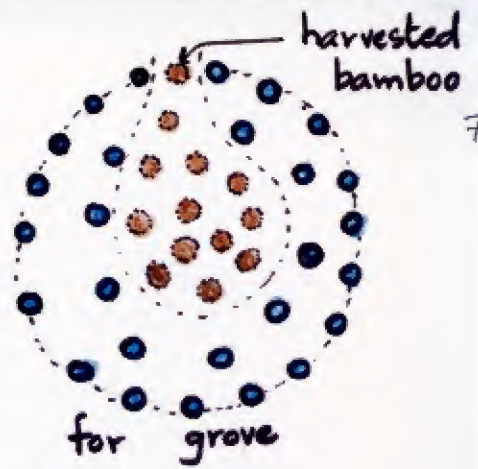
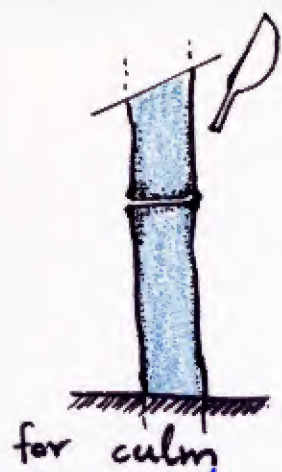
- Trim the lower branches on each pole



- Look out for pests or diseases.



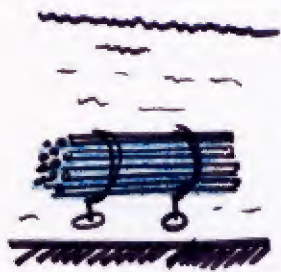
- Irrigate the plants, if there seems to be a lack of moisture.



When harvesting bamboo:

- Cut only mature poles (i.e 5 years and above).
- Cut just above a node.
- When removing the pole, ensure that there is no damage to nearby poles or branches.
- Place the harvested bamboo poles in an elevated rack for drying and curing. This way takes 4-6 weeks depending on the weather.

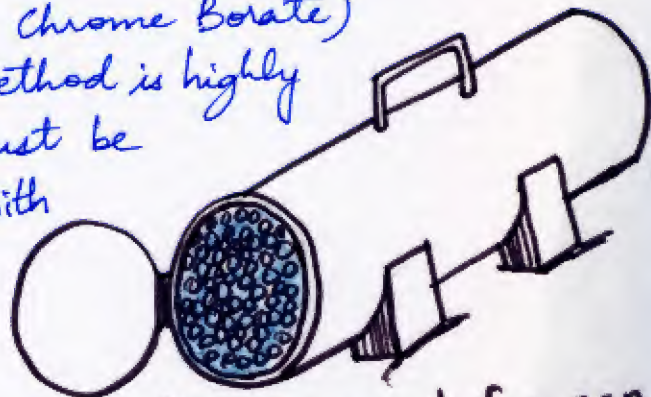
- Several traditional (time-tested) methods exist for increasing the life of bamboo.



- The most common is to bundle harvested poles and submerge them in watercourse for about 4 weeks, remove and then, air dry.

Nowadays with advances in technology, it is possible to protect bamboo against termites, fungi and borers using chemicals.

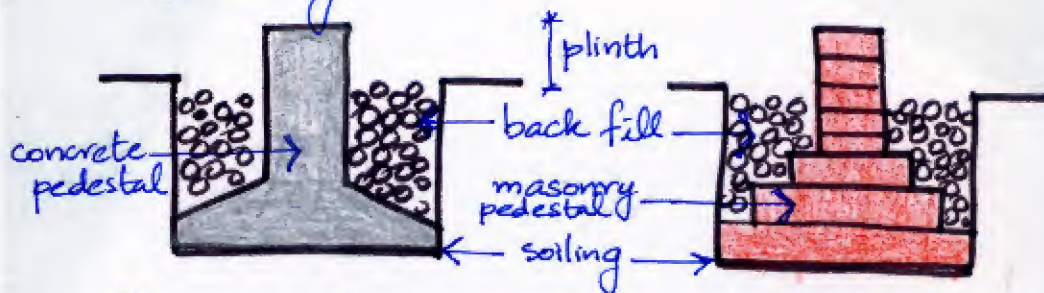
- For this the bamboos are loaded in a pressure vessel and treated with CCB (Copper Chrome Borate). But, this method is highly toxic and must be handled with utmost care.



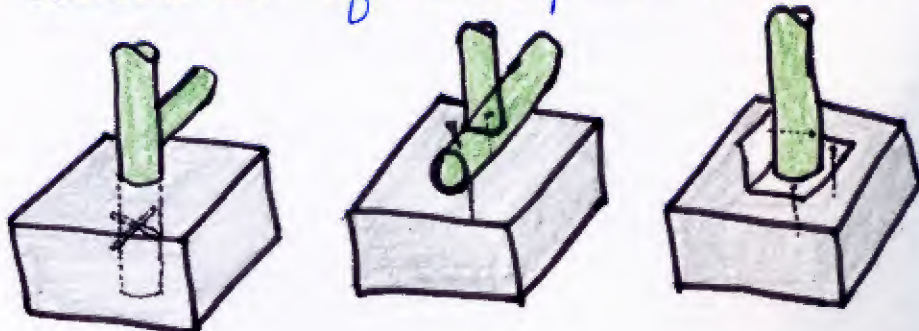
Pressure vessel for CCB

Basics of Design - Foundation

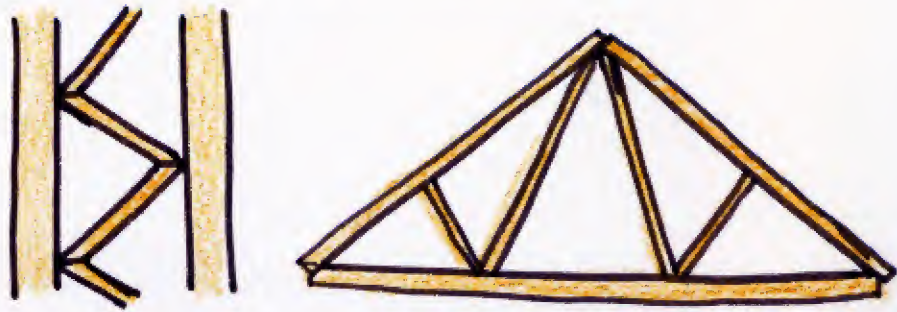
- Foundations & footings are made either in cement concrete or brick or stone masonry.



- For concrete foundation a mix of 1 part cement, 2 parts sand and 4 parts crushed stone is adequate.
- For masonry foundation use a cement mortar of 1 part cement and 3 parts sand.
- Columns may be embedded into the footings or fixed with bolts or a combination of metal plates & bolts.

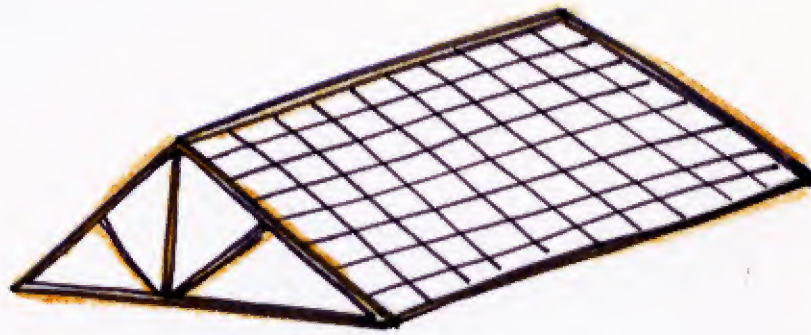


Basics of Design - Columns & Trusses



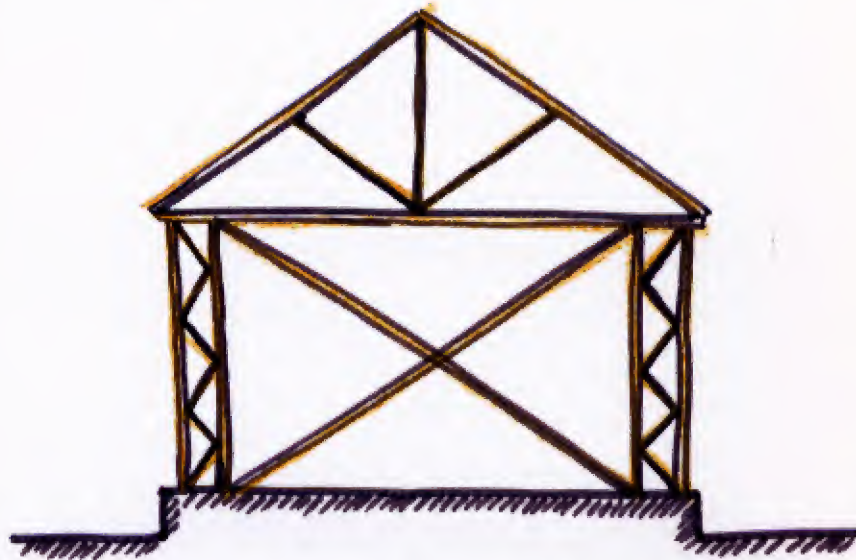
- Columns and trusses are the basic skeleton of the building structure
- They bear all the loads and stresses that we impose on the structure
- The easiest way of making columns and trusses is by direct bolting
- When designing a column or a truss, try to make triangles as simply as possible because triangles are stable.
- Where you think loads are greater use multiple bamboos.

Basics of Design - Roofing



- Designing the roof well is very important as it keeps the insides of the building safe from hot sun, rain and cold.
- The roof also provides stability to the skeleton structure made of columns and trusses
- A simple framework of purlins, rafters and battens is good enough to support any kind of roofing material
- The final roofing could be clay tiles, fibre boards or even tin sheets

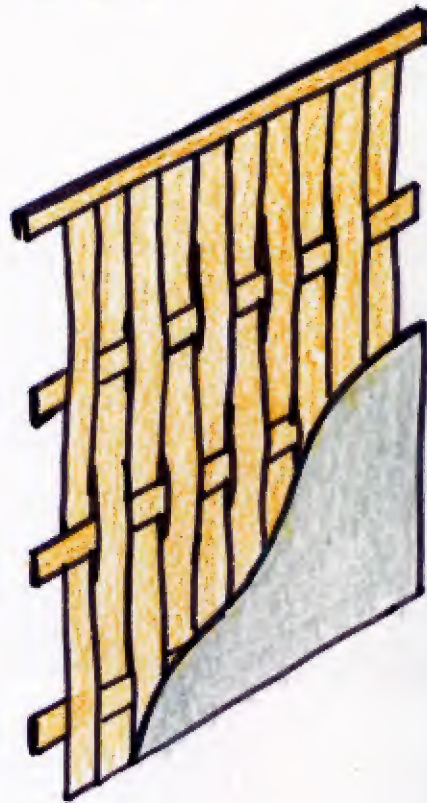
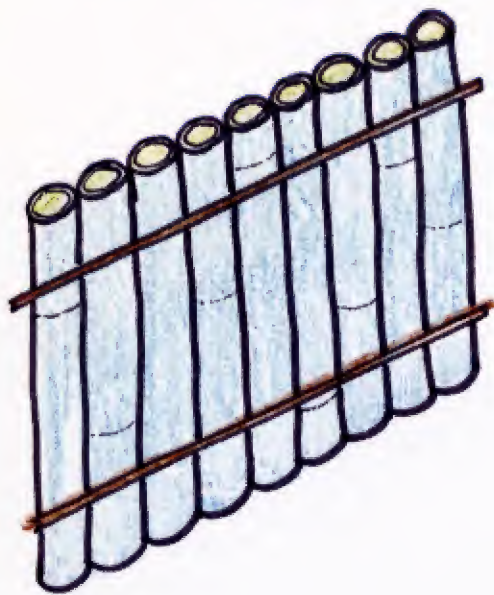
Basics of Design - Bracing



- A good system of cross-bracing between trusses and between columns ensures that the structure does not sway or get deformed in strong winds

Basics of Design - Walls

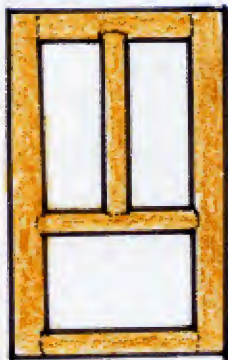
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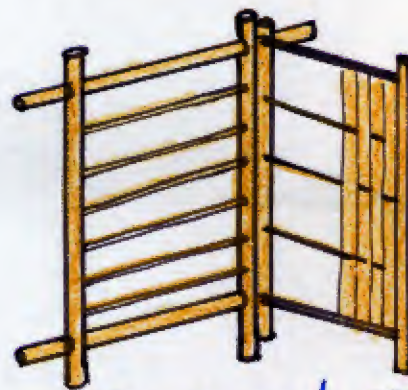
- Walls can be made using whole bamboo culms or woven split bamboo.
- Near the ground, it can be plastered using cement mortar, lime mortar or mud.
- Strips tied vertical is preferred - allows easy drying after rain.

Basics of Design - Non-structural members

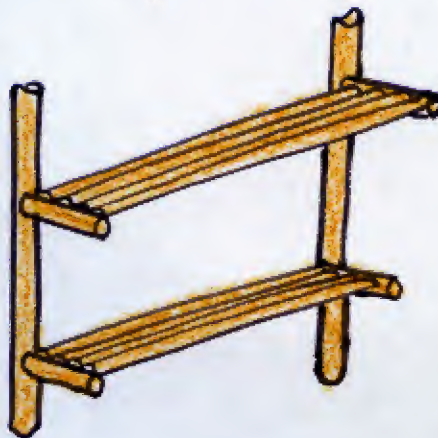
14



Doors and windows
made using laminated
bamboo plywood.



Doors and windows
made using woven split
bamboo.



Cupboard

Simple Rules to Follow While

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Designing a Structure

- Do not WRITE or scribble on scraps of pages. Maintain a notebook for each building.
- Make drawings or sketches of different parts of the building in the order of construction.
- As your ideas about the building are progressing in the notebook, start making a small model of the structure (at least columns, beams, trusses and bracing). This will help you design better.
- Always maintain detailed notes of all your ideas including concrete proportions, mixes, nut-bolt sizes, any special tools required.
- In the last few pages of the notebook make a time schedule. This describes the stages of construction, the time needed for each stage, manpower and building material needs. This will ensure that you are always well prepared for the work at hand.